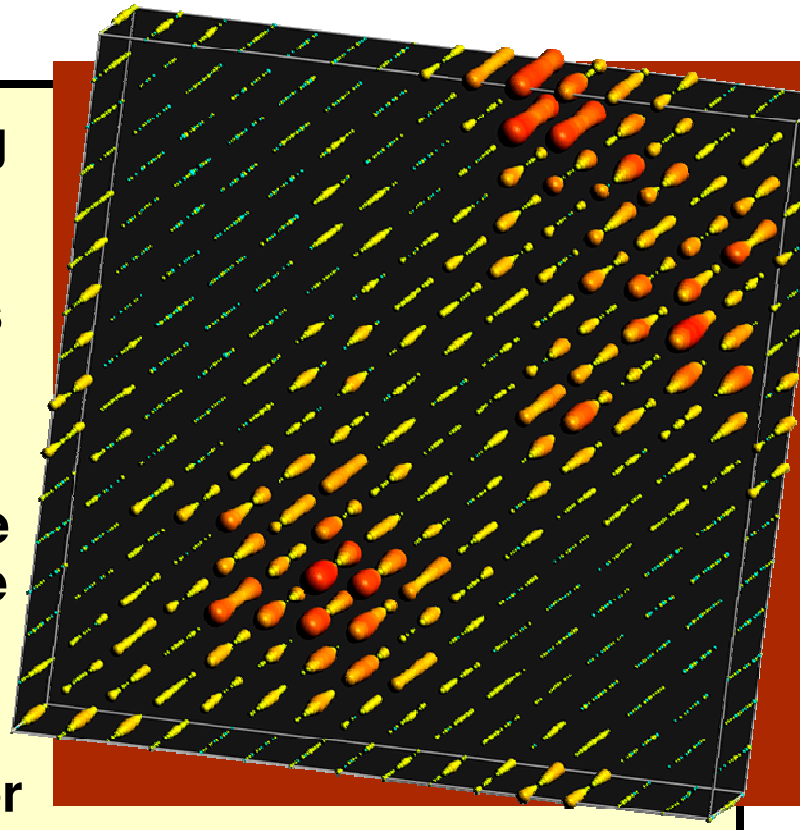
NCCS Snapshot
The Week of April 14, 2008

NATIONAL CENTER
FOR COMPUTATIONAL SCIENCES

Oak Ridge National Laboratory
U.S. Department of Energy

Quantum Spin Doctors Dissect Exotic States of Matter

- A team led by Tommaso Roscilde is using ORNL's Cray XT4 Jaguar supercomputer to explore the quantum mechanical phenomena that give us superconductors and superfluids
- A grant for 800,000 processor hours in 2007 allowed for the simulation of a lattice of atoms in a quantum magnet to examine two extraordinary quantum phases
- The team is using a technique called Quantum Monte Carlo to simulate disorder in a quantum magnet and thereby create Bose glass



"I find that in this particular instance of a study of a solid-state system, you're really trying to tailor matter to a level of control that was unthinkable a few decades or even a few years ago."

Tommaso Roscilde, France's École Normale Supérieure de Lyon

Jaguar sheds light on Bose glass

NICS Unleashes Kraken

New system prepares for transformational science

- **The National Institute for Computational Sciences (NICS) was dedicated on April 3 at Oak Ridge National Laboratory**
- **The Center, which features a Cray XT4 dubbed Kraken, is the result of a National Science Foundation Track II award of $65 million to the University of Tennessee and its partners**

- **Kraken will come online in mid-summer and is expected to feature over 18,000 2.3GHz AMD high-performance cores delivering 170 teraflops of performance**

"What this NSF grant does is permit us to have a new supercomputer that works side-by-side with DOE's supercomputing capacity that's already in place for open science, and become an even greater center for supercomputing." **Senator Lamar Alexander**

L to R: Thomas Zacharia, Associate Laboratory Director, ORNL Computing and Computational Sciences Directorate, Tennessee Governor Phil Bredesen, UT President John Petersen, and ORNL Director Thom Mason

Weigand Wins DOE Award

ORNL researcher recognized for ASCI

- Gilbert G. Weigand of Oak Ridge National Laboratory's Computing and Computational Sciences Directorate has received the inaugural James R. Schlesinger Award
- Weigand is credited with conceiving and implementing the DOE's Accelerated Strategic Computing Initiative (ASCI), a pooling of government programs and national laboratories to build the world's best supercomputers
- Energy Secretary Samuel Bodman praised Weigand's "passion for excellence along with his ability to foster and implement the practices and values that are necessary for the protection of our nation"

Gilbert Weigand

NCCS Continues Outreach Success

HPC conference showcases student research

"The purpose of the conference was to provide information that educators can incorporate into their curricula as well as provide students with a foundation in the basics of parallel programming."

Bobby Whitten, NCCS User Assistance & Outreach

- **The NCCS recently hosted the 2008 High Performance Computing and Applications Conference**
- **Students from universities across the southeastern U.S. were invited to submit posters, abstracts, and papers for peer review**
- **Approximately 12 students and 12 faculty members from universities such as Clemson and Western Kentucky were present. Research presented included robotics for evaluating natural disasters and galactic collision models**

Kothe Guest Speaker at HPC User Forum

Doug Kothe

- Doug Kothe was a keynote speaker at this year's HPC User Forum in Norfolk, Virginia and was named to the Steering Committee
- Kothe's talk, entitled "National Lab HPC Directions at ORNL," explored the future of high-performance computing at one of America's top supercomputing centers: Oak Ridge National Laboratory
- The HPC User Forum is a regular gathering of industry, government, and academia that meets to discuss technology and software trends, market dynamics, and possible collaborations to advance the state-of-the-art in high performance computing

NCCS Director of Science discusses ORNL's supercomputing future